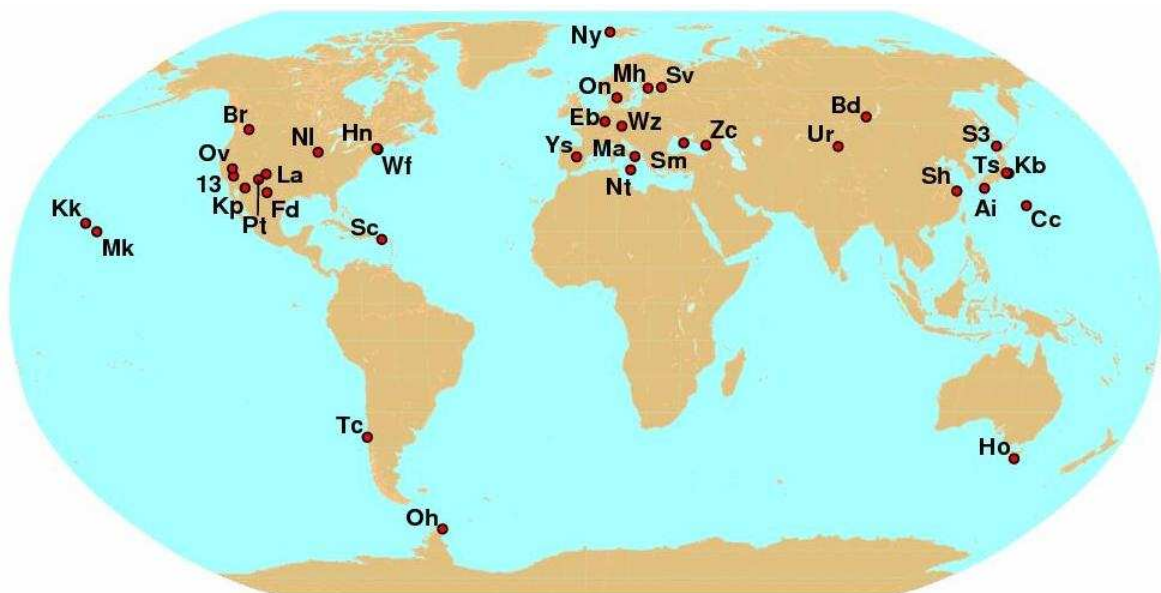


## World-size Telescope Conducts Largest Astrometric VLBI Session Ever Observed

Thirty-five radio telescopes around the world will conduct an unprecedented continuous 24-hour observation of nearly 250 remote quasars this week. The collection of quasars, whose positions in the sky are precisely known, forms the core (or defining sources) of a grid of celestial landmarks called the International Celestial Reference Frame (ICRF2), which was officially recognized as the fundamental reference system for astronomy by the International Astronomical Union (IAU) in August 2009. The ICRF2 has 295 defining sources that are spread evenly over the sky and out of which 243 will be observed. The small number of stations in the Southern Hemisphere is the reason why some of the southern defining sources will not be observed. The observation, the largest of this type ever conducted in terms of both the number of participating telescopes and the number of quasars to be observed, will mark the kickoff for the use of this new system. The session is also organized as a specific event for the International Year of Astronomy (IYA2009) and is dedicated to reach out to the public and to promote science with open doors at the radio telescopes.



*World map showing the location of the 35 radio telescopes to be used for the International Year of Astronomy (IYA2009) special astrometric VLBI observation of 243 quasars on 18–19 November 2009.*

Telescopes in Asia, Australia, Europe, North America, South America, Antarctica, and in the Pacific will coordinate for the observation, forming a special network called a Very Long Baseline Interferometer (VLBI). Such a network has the spatial resolution of a radio telescope as large as the network, allowing one to pinpoint positions of quasars to unprecedented precision. The 35-element world-size radio telescope that was put together for the event will be unique in its ability to observe most of the ICRF2 quasars at once and to strengthen the ICRF2 grid.

The observation is coordinated by the International VLBI Service for Geodesy and Astrometry (IVS) and will take place from **Wednesday 18 November, 18:00 UT to Thursday 19 November, 18:00 UT**. Further details may be obtained from the IVS Web site at <http://ivsc.gsfc.nasa.gov/program/iya09/>.

A dynamic Web site hosted by the University of Bordeaux at <http://iya09-ivs.obs.u-bordeaux1.fr> will show live VLBI images of the 243 quasars as they are observed during the session.

## About Quasars

Quasars are remote objects, typically brighter than a billion suns, which are embedded in the center of galaxies. Scientists believe that these are powered by giant black holes feeding on nearby gas. Gas trapped in the black hole's powerful gravity is compressed and heated to millions of degrees, giving off intense light and/or energy. Most quasars lurk in the outer reaches of the cosmos, over a billion light years away, and are therefore distant enough to appear stationary to us. Quasars make ideal targets to build precise and stable fundamental reference systems for astronomy.

## About Very Long Baseline Interferometry (VLBI)

Very Long Baseline Interferometry (VLBI) is an astronomical technique by which multiple radio telescopes observe the same region of the sky simultaneously. Data from each telescope is sampled and sent to a central processor which decodes, aligns and correlates the data for every possible pair of telescopes, allowing astronomers to generate images of cosmic radio sources with up to one hundred times better resolution than images from the best optical telescopes. The VLBI data also allows astronomers to measure the positions in the sky of distant quasars with exquisite precision, about 0.00000005 degrees, equivalent to the thickness of a pencil when viewed across the Atlantic Ocean. Such quasar directions are used as landmarks in space to position the Earth and to track small disturbances in its rotation and shape. These originate from a variety of phenomena including changes in weather systems, flexing of the Earth's crust due to tides, shifting of the antenna locations from plate tectonics and earthquakes.

## About the International VLBI Service for Geodesy and Astrometry (IVS)

The International VLBI Service for Geodesy and Astrometry (IVS) is an international collaboration of organizations which operate or support VLBI observations for geodetic, geophysical, and astrometric research and operational activities. IVS provides data and products for the scientific community. The primary products are:

- a terrestrial reference frame (TRF), consisting of sub-centimeter three-dimensional locations of the radio telescopes on Earth;
- the International Celestial Reference Frame (ICRF), based on highly-precise positions of distant quasars; and
- Earth orientation parameters (EOP).

All IVS data and products are archived in data centers and are publicly available.

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### Participating telescopes

AIRA	Ai	Aira, Kagoshima, Japan
BADARY	Bd	Badary Radioastronomical Observatory, Russia
CHICHI10	Cc	Chichijima, Ogasawara, Japan
CRIMEA	Sm	Simeiz VLBI Station, Crimean Astrophysical Observatory, Ukraine
DSS13	13	Goldstone (DSN), CA, USA
EFLSBERG	Eb	Radio Telescope Effelsberg, Germany
HOBART26	Ho	Mt. Pleasant Observatory, Hobart, Tasmania, Australia
KASHIM34	Kb	Kashima Space Research Center, Japan
KOKEE	Kk	Kokee Park Geophysical Observatory, Kauai, HI, USA
MATERA	Ma	Matera CGS VLBI Station, Italy
METSAHOV	Mh	Metsähovi Radio Observatory, Finland
NOTO	Nt	Noto VLBI Station, Italy
NYALES20	Ny	Ny Ålesund Geodetic Observatory, Spitsbergen, Norway
OHIGGINS	Oh	German Antarctic Receiving Station O'Higgins, Antarctica
ONSALA	On	Onsala Space Observatory, Sweden
SESHAN25	Sh	Sheshan VLBI Station, Shanghai, China
SINTOTU3	S3	Shintotsukawa, Hokkaido, Japan
SVETLOE	Sv	Svetloe Radio Astronomy Observatory, Russia
TIGOCONC	Tc	Transportable Integrated Geodetic Observatory (TIGO), Concepción, Chile
TSUKUB32	Ts	Tsukuba VLBI Station, Japan
URUMQI	Ur	Nanshan VLBI Station, Urumqi, China
WESTFORD	Wf	Westford Antenna, Haystack Observatory, MA, USA
WETTZELL	Wz	Fundamentalstation Wettzell, Germany
YEBES40M	Ys	National Astronomical Observatory Yebes, Guadalajara, Spain
ZELENCHK	Zc	Radioastronomical Observatory Zelenchukskaya, Russia

The 10 VLBA stations are:

Brewster	Br	VLBA near Brewster, WA, USA
Ft. Davis	Fd	VLBA near Ft. Davis, TX, USA
Hancock	Hn	VLBA near Hancock, NH, USA
Kitt Peak	Kp	VLBA on Kitt Peak, AZ, USA
Los Alamos	La	VLBA near Los Alamos, NM, USA
Mauna Kea	Mk	VLBA on Mauna Kea, HI, USA
North Liberty	Nl	VLBA near North Liberty, IA, USA
Pie Town	Pt	VLBA near Pie Town, NM, USA
Owens Valley	Ov	VLBA in Owens Valley, CA, USA
St. Croix	Sc	VLBA on St. Croix, VI, USA